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IDENTIFICATION OF SECONDARY METABOLITES FROM PENTATROPIS MICROPHYLLA BY GC-MS ANALYSIS

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ABSTRACT

Background: The present study was aimed to determine the presence of biomolecules in the ethanolic leaves extract of *Pentatropis microphylla*. **Materials and Methods:** *Pentatropis microphylla* leaves extract was used. Gas Chromatography Mass Spectrum equipment used for identification and determination of the bio active compounds. **Results:** The GC-MS results have shown the different type of secondary metabolites present in the extract. A total of 28 bio active compounds were identified by GC-MS. Out of 28 compounds 2 compounds have shown highly potent 1,6-Anhydro- α -D-glucopyranose (28.7332%) and Propane, 1,1,3-triethoxy (25.9192%) respectively. **Conclusion:** From the results, it is evident that *Pentatropis microphylla* contains various secondary metabolites, which may heal many diseases. Hence, it is recommended for further evaluation of its pharmacological activity.

KEYWORDS: *Pentatropis microphylla*, 1,6-Anhydro- α -D-glucopyranose, Propane, 1,1,3-triethoxy

INTRODUCTION

Past five or six decades thousands of secondary metabolites have been identified and it is utilizing by the pharmaceutical industry for making drugs for various ailments as well as cosmetics; and estimated that thousands of these compounds still exist. Many researchers have been discussed in a lot of literature, reviews and reports about the importance of natural products (1).

Well established and formulated herbal remedies are used around the world varies with the technological advancements of countries that produce and use them. So far, several drugs including strychnine, vincristine, taxol, ergot, etc., are of herbal originated and have involved as a result of extensive ethnomedical research. The field of ethnomedicine play a vital role in the current research and development of important and potent needed medicines for various ailments and disorders.

Herbal based drugs have been well known facts that successfully treat chronic disease conditions with minimal adverse effects and low cost. Hence there is an increased necessity to find out the bioactive compounds from medicinal plants.

AIM AND OBJECTIVE

The aim of the present study is to examine the Phytochemical compounds present in the ethanol leaves extract of *Pentatropis microphylla* by Gas-Chromatography and Mass Spectrophotometer (GC-MS) analysis.

MATERIALS AND METHODS

Pentatropis microphylla belongs to the family Asclepiadaceae twining, perennial herb. Leaves are 1-3.5 cm long, 0.5-2.5 cm wide broadly oblong or ovate elliptic.

PLANT SAMPLE EXTRACTION

Plant material – *Pentatropis microphylla* leaves were collected from Cauvery river belt in Tiruchirappalli District of Tamil Nadu and washed through tap water and kept air dried at room temperature for 3 weeks and grounded into powder. The 20gm of powder material was extracted successively using ethanol solvent to soxhlet extractor. Then the crude extract was kept at 4^o C for further use. Then took 2 mg of crude extract and dissolved 5ml of absolute alcohol for few minutes and then filtered through Whatman filter paper No.1, before filtering, the filter paper along with sodium sulphate is wetted with alcohol. The extract contains both polar and non-polar phytoconstituents.

GC MS ANALYSIS

GC-MS analysis was carried out on a GC Clarus 500 Perkin Elmer system comprising a AOC-20i auto sampler and gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions. Column Elite-5ms fusedsilica capillary column (30mmx0.25mm ID x 1μ M df, composed 5% Phenyl 95% dimethylpolysiloxane), operating in electron impact mode at 70 eV helium (99.999%) was used as carrier gas at a constant flow of 1ml/min and an injection volume of 0.5 μ l was employed (split ratio of 10:1) injector temperature 250^o C, ion source temperature 280^o C. The oven temperature was programmed from 110^o C (isothermal for 2min), with an increase of 10^o C/min, to 200^o C, then 5^o C/min to 280^o C, ending with a 9min isothermal at 280^o C. Mass spectra were taken at 70 eV, a scan interval of 0.5 seconds and fragments from 45 to 450 Da. Total GC running time was 36 minutes.

IDENTIFICATION OF ACTIVE COMPOUNDS

Interpretation on mass spectrum GC-MS was conducted using the database of National Institute Standard and Technology (NIST) having more than 62,000 patterns. The spectrum of the unknown compound was compared with the spectrum of the known compound stored in the NIST library. The name, molecular weight and structure of the compounds of the test material were ascertained.

RESULTS AND DISCUSSION

The results have shown in Figure 1. Totally twenty eight compounds were identified in the ethanolic leaves extract of *Pentatropis microphylla* by GC-MS analysis. The active molecules were compared with standard library and identified. The active principles retention time (RT), molecular formula, molecular weight (MW) and concentration (%) are presented in the Table 1. Among the twenty eight compounds two compounds have been identified as most prevailing compounds such as 1,6-Anhydro- α -D-glucopyranose (28.7332%) and Propane, 1,1,3-triethoxy- (25.9192%).

Based on our results the plant definitely have pharmacological activity because of the presence of the bio active compounds.

CONCLUSIONS

As many previous researchers reported that most of the biomolecules have anti microbial or anti diabetic activity. Since, there is no evidence or previous study conducted in this plant. Hence, we recommended for further research to identify its pharmacologic activity by *In-vitro* or *In-vivo* method.

FIGURE 1: *PENTATROPISMICROPHYLLA* CHROMATOGRAM

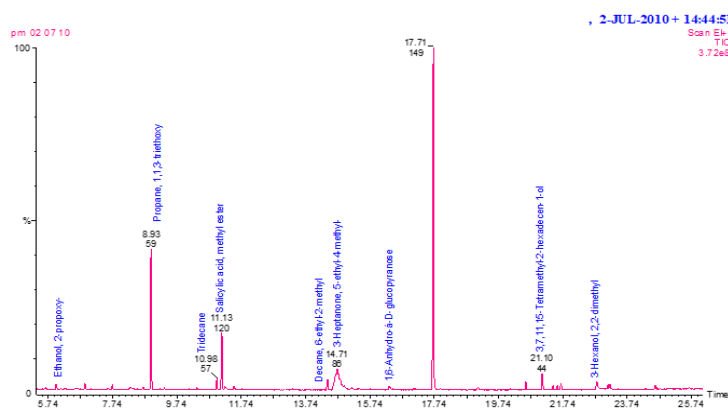


TABLE 1: COMPOUNDS IDENTIFIED IN *PENTATROPISMICROPHYLLA*

S.No.	Peak Name	Retention Time	Peak Area	Peak Area %
1	Ethanol, 2-propoxy- <u>Formula:</u> C ₅ H ₁₂ O ₂ <u>MW:</u> 104	5.98	229568	1.5782
2	Vinyl Ether <u>Formula:</u> C ₄ H ₆ O <u>MW:</u> 70	6.58	101218	0.6958
3	Pentane, 1,1-diethoxy- <u>Formula:</u> C ₉ H ₂₀ O ₂ <u>MW:</u> 160	6.88	224878	1.5459
4	Glycerin <u>Formula:</u> C ₃ H ₈ O ₃ <u>MW:</u> 92	7.07	17364	0.1194
5	Decane, 2,5,9-trimethyl- <u>Formula:</u> C ₁₃ H ₂₈ <u>MW:</u> 184	7.73	190733	1.3112
6	Benzene, (1,1-dimethylethoxy)- <u>Formula:</u> C ₁₀ H ₁₄ O <u>MW:</u> 150	7.61	70437	0.4842
7	3,3-Diethoxy-1-propanol <u>Formula:</u> C ₇ H ₁₆ O ₃ <u>MW:</u> 148	8.53	13328	0.0916
8	Benzeneacetaldehyde <u>Formula:</u> C ₈ H ₈ O <u>MW:</u> 120	8.67	87885	0.6042
9	Propane, 1,1,3-triethoxy- <u>Formula:</u> C ₉ H ₂₀ O ₃ <u>MW:</u> 176	8.93	3770368	25.9192
10	Hexane, 1,1-diethoxy- <u>Formula:</u> C ₁₀ H ₂₂ O ₂ <u>MW:</u> 174	9.20	29025	0.1995
11	Hydroperoxide, 1-methylbutyl <u>Formula:</u> C ₅ H ₁₂ O ₂ <u>MW:</u> 104	9.83	28997	0.0031
12	4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl- <u>Formula:</u> C ₆ H ₈ O ₄ <u>MW:</u> 144	10.36	61812	0.1993
13	Tridecane <u>Formula:</u> C ₁₃ H ₂₈ <u>MW:</u> 184	10.98	273151	0.4249
14	Salicylic acid, methyl ester <u>Formula:</u> C ₈ H ₈ O ₃ <u>MW:</u> 152	11.13	1766373	1.8778
15	Pyrocatechol <u>Formula:</u> C ₆ H ₆ O ₂	11.23	210483	12.1429

	<u>MW:</u> 110			
16	Dianhydromannitol <u>Formula:</u> C ₆ H ₁₀ O ₄	11.50	132329	1.4470
	<u>MW:</u> 146			
17	Decane, 6-ethyl-2-methyl- <u>Formula:</u> C ₁₃ H ₂₈	14.42	348531	0.9097
	<u>MW:</u> 184			
18	3-Heptanone, 5-ethyl-4-methyl- <u>Formula:</u> C ₁₀ H ₂₀ O	14.71	4179706	2.3960
	<u>MW:</u> 156			
19	1,6-Anhydro- α -D-glucopyranose (levoglucosan) <u>Formula:</u> C ₆ H ₁₀ O ₅	16.33	347836	28.7332
	<u>MW:</u> 162			
20	3,4-Hexanediol, 2,5-dimethyl- <u>Formula:</u> C ₈ H ₁₈ O ₂	17.13	65379	2.3912
	<u>MW:</u> 146			
21	4-Tetradecanol <u>Formula:</u> C ₁₄ H ₃₀ O	19.10	96666	0.4494
	<u>MW:</u> 214			
22	3,7,11,15-Tetramethyl-2- hexadecen-1-ol <u>Formula:</u> C ₂₀ H ₄₀ O	21.10	547443	0.6645
	<u>MW:</u> 296			
23	Z-2-Dodecenol <u>Formula:</u> C ₁₂ H ₂₄ O	21.43	137403	3.7634
	<u>MW:</u> 184			
24	3-Hexanol, 2,2-dimethyl- <u>Formula:</u> C ₈ H ₁₈ O	22.79	567332	0.9446
	<u>MW:</u> 130			
25	Pentadecanoic acid, 2,6,10,14- tetramethyl-, methyl ester <u>Formula:</u> C ₂₀ H ₄₀ O ₂	23.12	116017	3.9001
	<u>MW:</u> 312			
26	Oxalic acid, allylpentadecyl ester <u>Formula:</u> C ₂₀ H ₃₆ O ₄	24.61	122722	0.7976
	<u>MW:</u> 340			
27	Pentadecanoic acid, 2,6,10,14- tetramethyl-, methyl ester <u>Formula:</u> C ₂₀ H ₄₀ O ₂	25.61	39941	0.8436
	<u>MW:</u> 312			
28	Squalene <u>Formula:</u> C ₃₀ H ₅₀	31.89	769226	0.2746
	<u>MW:</u> 410			

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